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ABSTRACT

The semantic differential ratings of ten typefaces given by a group of 24 subjects were factor analyzed to discover what connotative meanings laypeople applied to typefaces and how these meanings compared with those of professional typographers. The typefaces, five from general categories and five from novelty categories of display typefaces, were Helvetica, Garamond, Bodoni, Palatino, Times Roman, Cloister Black, Excelsior Script, Broadway, Libra, and Legend. The factor structure of the semantic scales revealed five dimensions of connotative meaning: potency, elegance, novelty, antiquity, and evaluation. Helvetica, the only sans serif typeface, was not perceived as differing significantly from serifed typefaces on most dimensions. Garamond, Bodoni, Palatino, and Times Roman were also perceived as having similar connotative meanings even though they were from different typeface classifications. Libra and Legend, two very distinctive novelty typefaces, were fairly neutral on all factor dimensions. At least four of the ten typefaces tested can be used interchangeably for display purposes. Connotations of the other typefaces generally reinforce the current practices of media professionals. (References, the ten display typeface samples, and a listing of connotative dimensions for each typeface tested are included.) (RL)

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# THE CONNOTATIVE DIMENSIONS OF SELECTED DISPLAY TYPEFACES

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## ABSTRACT

This paper reports my research on the use of the semantic differential to determine the connotative meaning of ten display typefaces using laymen as subjects. These typefaces were Cloister Black, Excelsior Script, Broadway, Legend, Libra, Helvetica, Garamond, Bodoni, Palatino, and Times Roman. There were several surprising outcomes of the study. Helvetica, the only sans serif typeface, was not perceived as differing significantly from serifed typefaces on most dimensions. Garamond, Bodoni, Palatino, and Times Roman were also perceived as having similar connotative meanings although they are from different typeface classifications. Libra and Legend, two very distinctive novelty typefaces, were fairly neutral on all factoral dimensions. A listing of connotative dimensions for each typeface tested is included in the report.

THE CONNOTATIVE DIMENSIONS OF

SELECTED DISPLAY TYPEFACES

Every message uses two codes--a "digital" code, usually words, to transmit the message's information, and an "analogic" code, usually paralinguistic, kinetic, iconic, and/or indexical, to express and elicit feelings about the message and its source.[1] The analogic code is generally more subtle and more ambiguous than the digital code, but is no less important, especially for media professionals.

In the print medium, one important and obligatory element of the analogic code is typeface. (Others are length of line, type size, spacing, paper color and quality, shape of message, etc.) As Ovink says, "The typographer. . . who did not hit upon the specially appropriate type, will not have done actual harm to the transmission of the text, but he has missed an opportunity to intensify the force of impression of the text in a considerable degree."[2]

Designers and scholars have given a great deal of advice about typographical choices, some based on research, to media professionals in the past fifty years. Most of this advice has attempted to match typefaces to products and/or message content on the basis of "appropriateness" or "congeniality" or "atmosphere value" or "feeling tone."

One of the first studies to deal with congeniality was conducted by Anna Berliner in 1920.[3] She had subjects classify typefaces according to four products: fish, pancake flour, pork and beans, and orange marmalade. Poffenberger and Franken[4] had subjects relate typefaces to five feelings and five products but did not take apparent sizes of typefaces into account. Davis and Smith[5] corrected this in their experiment relating typefaces to 23 products and 24 feelings; however, they were more interested in the differences between variations within a typeface family (size, boldness, inclination, and condensation) than

in differences among typefaces. Schiller[6] introduced color into the congeniality research, using the same design as Poffenberger and Franken, with different typefaces. Ovink[7] studied the appropriateness of 30 typefaces for eight literary subjects and eight ideas, findin that the typefaces clustered in three categories: luxury-refinement, economy-precision, and strength. Finally, Burt[8] investigated the correlations between legibility and appropriateness.

Printers and designers have also seen the need for a way to relate typefaces to content. Secrest[9] described the "personalities" of typefaces by relating them to people and their characteristics. Baylis[10] told designers how to choose the correct typeface for a message, classifying typefaces as masculine, feminine, classy, dignified, smart, old-fashioned, modern and workhorse. Other designers including Tschichold, Zapf, Mengel, Ruder, Schaer, and Schantze have also given their opinions of appropriate typefaces.[11] These opinions differed on both the possibility of creating atmosphere with typefaces and the advisability of trying to do so.

These studies have dealt mainly with body types and their relationships to various products and feelings. Although this provides very concrete information, it can be limiting since few generalizations can be made about all typefaces or all products and feelings.

One way of overcoming the excessive specificity inherent in these studies is to find an instrument to measure the general dimensions or factors of connotative meaning elicited by typefaces. If these general dimensions are known for particular typefaces, then typefaces can be matched for congeniality (or, for particular purposes, uncongeniality) with the connotative dimensions of particular products or message contents.

The semantic differential, developed by Osgood, Suci, and Tannenbaum[12] has been a useful research tool for discovering dimensions of connotative meaning,

and a few previous studies have applied it to typefaces. Brinton[13] and Tannenbaum, Jacobson, and Norris[14] both used the semantic differential to discover the differences between the perceptions of typeface connotations among professionals and laymen. Brinton discovered similarities between the way both professionals and laymen judged 13 typefaces, although professionals tended to use more adjectives to describe them. He also generated a list of characteristics for the typefaces. Tannenbaum, Jacobson, and Norris, on the other hand, were more interested in the differences in judgments and variations within typeface families. They too found that both professionals and laymen, as well as a third group, semi-professionals (typography students), share many of the same opinions on typefaces. Wendt[15] used a German semantic differential to place 35 European typefaces in semantic space and show some relationships between them and German concepts. He also generated a short list of characteristics for these typefaces.

This study follows the same tradition. It focuses on display typefaces. Since my interest is in the effects of typefaces on their readers, I conducted the study using only lay subjects.

## Method

For this study, I chose ten display typefaces--five from general categories and five from novelty categories.[16] The general typefaces, Helvetica, Garamond, Bodoni, Palatino, and Times Roman, were chosen because they are popular and in the past have been assigned fairly different connotations.[17] The novelty typefaces, Cloister Black, Excelsior Script, Broadway, Libra, and Legend, were chosen because they are all very different from each other in weight and features and because most of them have not previously been studied before.[18]

Each typeface was displayed on a 5 X 8½ inch sheet in a complete alphabetical listing including upper and lower case, numerals, and punctuation. (Exceptions

were Broadway and Libra which do not have both upper and lower case.) The ten typefaces are reproduced in the original size in Figures 1-10.

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INSERT FIGURES 1-10 ABOUT HERE

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The semantic differential scales used in this study were selected from Brinton's earlier study.[19] A few others were added as judged appropriate. The final set of scales is presented in Figure 11.

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INSERT FIGURE 11 ABOUT HERE

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The ten typefaces, arranged in a random order for each subject, were given to 24 subjects, each of whom judged each typeface on the set of semantic differential scales. The following directions were given to each subject:

> This is an experiment testing typeface connotations. Included in your packet are 10 scale sheets and 10 typeface samples in a random order. Begin by placing the scales in front of you and the typeface samples face down beside you. Number each scale sheet in the upper right corner under "Number." (1 through 10) Turn up the first sample. Place the number of the sample in the upper left corner of the first scale sheet under "Typeface." Fill out the scale for each characteristic by placing an "X" on the place on the line where you feel that typeface falls. The scale is understood as follows:

Example:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| | very | | more bad | neither bad | more good | | very | |
| bad | bad | bad | than good | nor good | than bad | good | good | good |

Do this quickly and with little thought. After you finish the first sample turn it over again and turn up the next and so on through the ten samples. Do not compare typefaces, just mark the connotations as they appear separately. When you are finished, turn in the packet with both the samples and the scales.

Testing was done individually for most of the subjects and each was allowed to ask questions and was asked not to compare ratings with anyone else participating in the study.

Each scale for each typeface was scored in a range from one to seven. These scores were then used in two statistical procedures. First, the scores were subjected to a principal components factor analysis with varimax rotation.[20] Then, on the basis of the factor analysis, the scale scores were combined into dimension scores, and the dimension scores were subjected to a Treatments X Subjects design for each dimension.[21]

## Results

### Factor Analysis

I used standard criteria for discarding scales and for assigning scales to dimensions on the basis of the factor analysis. One criterion for retention, met by all scales, was an eigenvalue of at least 1.0. The criterion for assigning a scale to a dimension was that the scale have a loading of at least .61 on that dimension and a loading of less than .41 on all other dimensions. On this criterion, I rejected eight scales (imperfect/perfect, passive/active, ornate/plain,

rounded/angular, graceful/awkward, honest/dishonest, formal/informal, and relaxed/stiff) from further analysis.

The remaining scales occupied five dimensions of connotative meaning for the typefaces tested. The scales and their loadings are shown in Table 1, with an asterisk identifying the dimension to which each scale was assigned.

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INSERT TABLE 1 ABOUT HERE

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The names I assigned to the five dimensions revealed by the factor structure were: (1) potency--seven scales, hard/soft, constrained/free, strong/weak, dark/light, masculine/feminine, rugged/delicate, and tight/loose; (2) elegance--four scales, rich/poor, beautiful/ugly, expensive/cheap, and meaningful/meaningless; (3) novelty--three scales, simple/complex, legible/illegible, and usual/unusual; (4) antiquity--two scales, old/new, and old-fashioned/modern; and (5) evaluation--two scales, bad/good, and dirty/clean.

Treatment X Subjects Analysis

To discover differences among the connotative meanings of the typefaces on each dimension, I summed the scale scores within the dimension and analyzed the resulting dimension scores in a Treatment X Subjects design. The mean score for each typeface on each dimension is shown in Table 2. For pairwise comparisons, I calculated a critical difference (.05 significance level) for each dimension.[22] The magnitude of the critical differences were as follows: potency, 3.80; elegance, 2.15; novelty, 1.70; antiquity, 1.62; and evaluation, 1.24. In Table 2, typefaces which do not differ significantly from each other on a dimension share at least one superscript in the same row.

INSERT TABLE 2 ABOUT HERE

## Discussion

The results of this study permit a connotative characterization of each typeface. I have summarized these characterizations in Figure 12, where the mean score for each typeface is plotted on each dimension. (Each dimension is represented by its highest-loading scale.)

INSERT FIGURE 12 ABOUT HERE

Cloister Black connotes slight potency, elegance, and novelty. It is perceived as neutral on the evaluation dimension. Its most outstanding characteristic (though it differs significantly from at least six other typefaces on all five dimensions) is its perceived antiquity.

Excelsior Script was perceived as the least potent of typefaces. It also connotes elegance, slight novelty, slight antiquity and a slightly positive evaluation. Next to Cloister Black, Excelsior Script was the most connotatively distinquishable of the typefaces.

Broadway connotes slight potency. Although it is considered by professionals to be a novelty typeface, it was judged as near neutral on the novelty dimension. It was perceived as the most modern of the ten on the antiquity dimension, however. It was neutral on both elegance and evaluation.

Legend was perceived much the same as Excelsior Script on most dimensions,

especially potency and novelty. The main difference seems to be weight, although one is a script typeface and the other is a cursive typeface; however, the two typefaces were at opposite ends of the evaluation dimension. In determining connotative characteristics, Legend was perceived as fairly novel but on all other dimensions was rated near neutral.

Libra was also reated near neutral on most of the dimensions. The exception was its connotations of slight antiquity. Libra was perceived as fairly close to Broadway on several dimensions including novelty and evaluation. This seems strange because the types are so dissimilar visually and because the typefaces are judged as opposites on potency and antiquity. It does give some indication of their relationship, however.

Helvetica was the only sans serif typeface in the study. Surprisingly, it did not differ from the serifed general typefaces on any dimension except antiquity, where it was seen as fairly modern. In previous studies[23] sans serifed typefaces have been perceived as differing a great deal from serifed typefaces. In this study, Helvetica connotes slight potency, the least novelty, and a slightly positive evaluation. It was near neutral on the elegance dimension.

Garamond, Bodoni, Palatino, and Times Roman did not differ from each other significantly on any dimension. This is surprising because in several previous studies several of these typefaces have been found by laymen to differ a great deal.[24] Many professionals also differentiate between them, classifying Bodoni as "modern," Times Roman as "transitional," and Garamond and Palatino as "oldstyle."[25] None of these differences appeared to be noticed by laymen in my study. All four typefaces connote slight potency, are decidedly not novel, and have a slightly positive evaluation. They were perceived as neutral on the elegance and antiquity dimensions.

The results of this study can be used by media professionals to help them match (or deliberately mismatch, if they have a reason) typeface connotations with desired product or message content connotations on the basis of information rather than intuition or serendipity. I am now doing a second study in which I hope to establish empirically the typeface characteristics that lay readers consider appropriate for various kinds of content. One conclusion from the study reported here is that at least four of the ten typefaces tested can be used interchangeably for display purposes. One of these four, surprisingly, is the "modern" (as labeled by professionals) Bodoni. Connotations of the other typefaces generally reinforce accepted wisdom, though the clustering of Helvetica with the standard typefaces on four of the five dimensions is mildly shocking. (Possibly, lay readers are becoming habituated to modern faces like Bodoni and sans serif faces like Helvica.) This kind of analysis obviously serves to make accepted wisdom more systematic and precise.

What typeface would I use to set the title of this paper, if I had a choice? I would like a potent, elegant, novel, modern and good option, for the content of the paper has all those qualities. However, none of the ten tested is high on all five dimensions, a problem that might be remedied as more typefaces are tested. Given all the information from my study, I would probably choose fairly potent, fairly modern, fairly good Helvetica as best matching my content. If I wanted to make a joke, I would choose old-fashioned Cloister Black.

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18. Cloister Black and Legend were exceptions. Burt, and Wendt, loc. cit.

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Figure 1-Cloister Black, 36 point

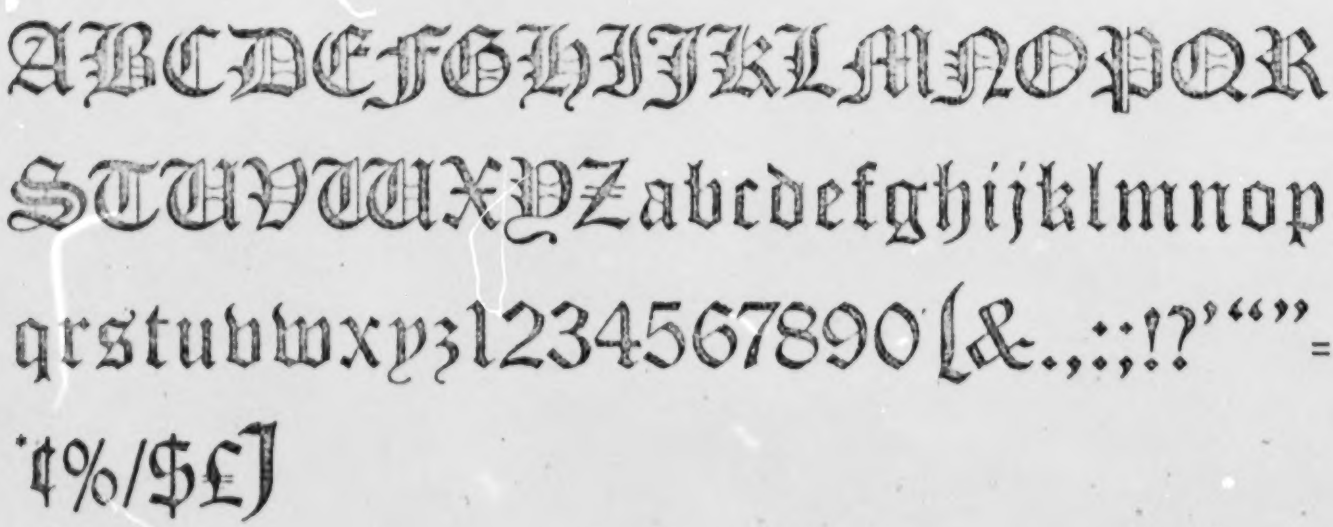


Figure 2-Excelsior Script, 36 point

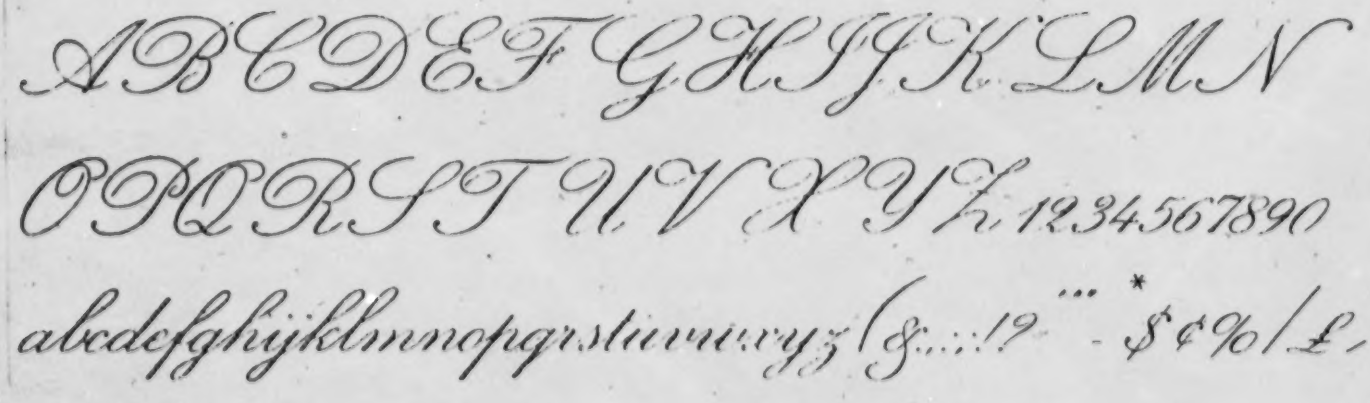

Figure 3-Broadway, 30 point

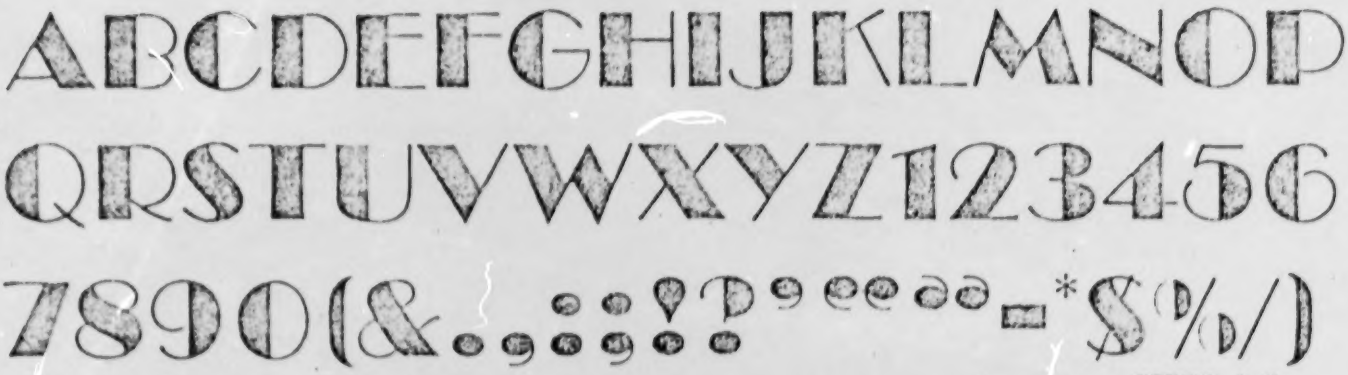


Figure 4-Legend, 48 point

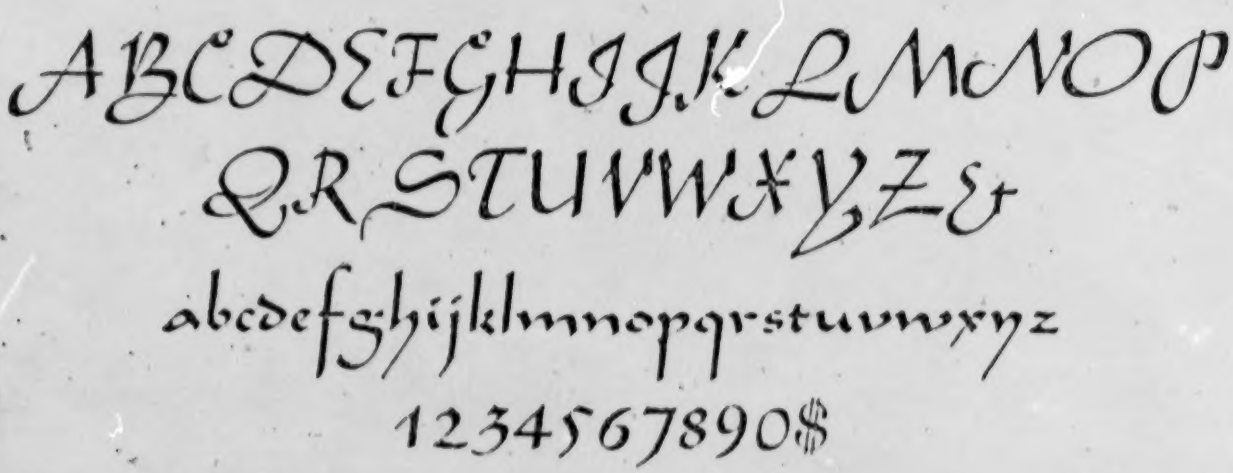

Figure 5-Libra, 36 point

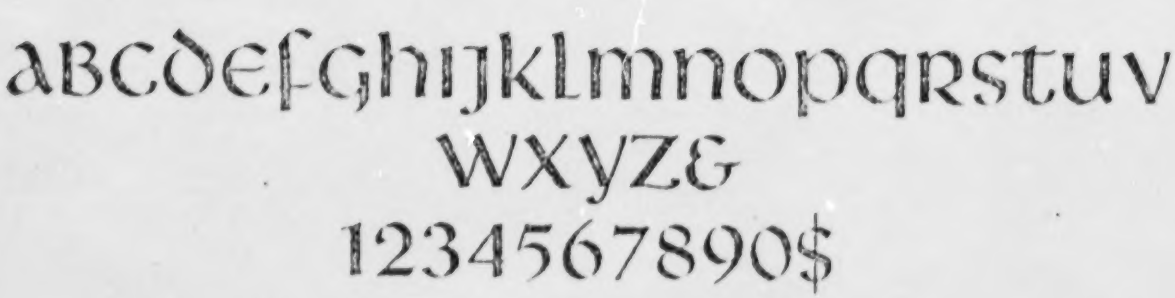


Figure 6-Helvetica, 42 point

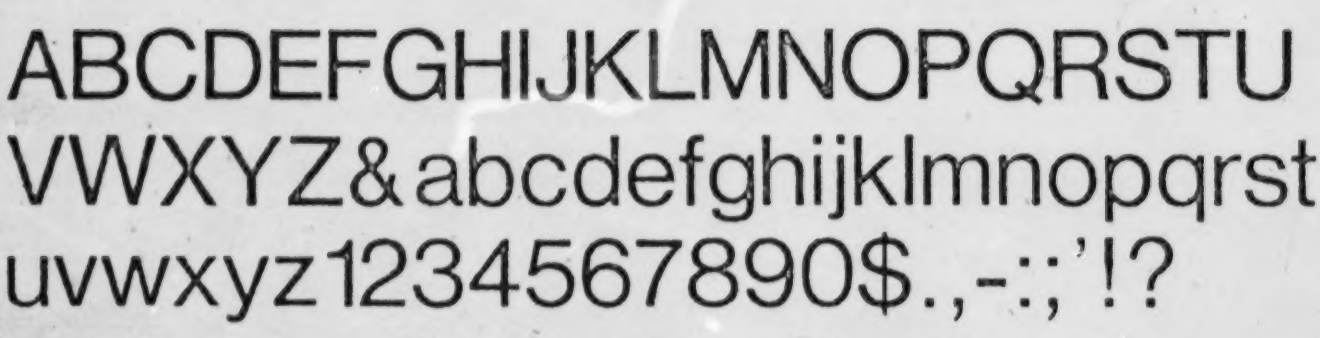

Figure 7-Garamond, 36 point

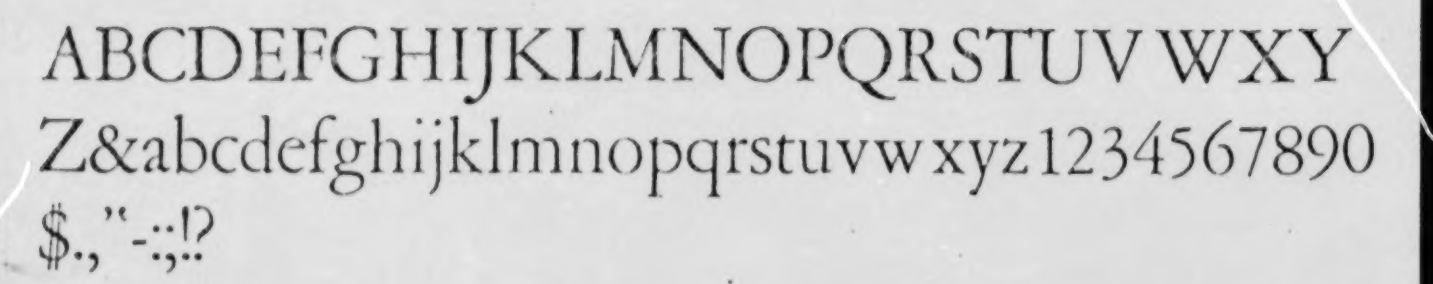


Figure 8-Bodoni, 36 point

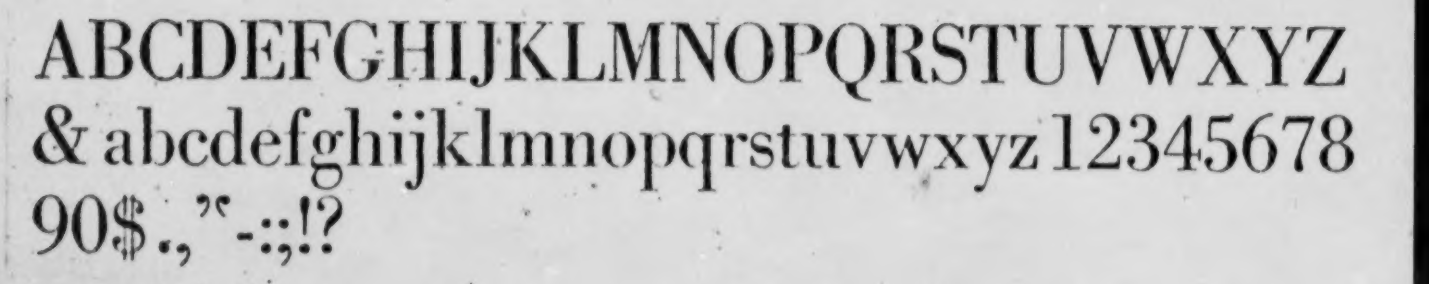

Figure 9-Palatino, 42 point

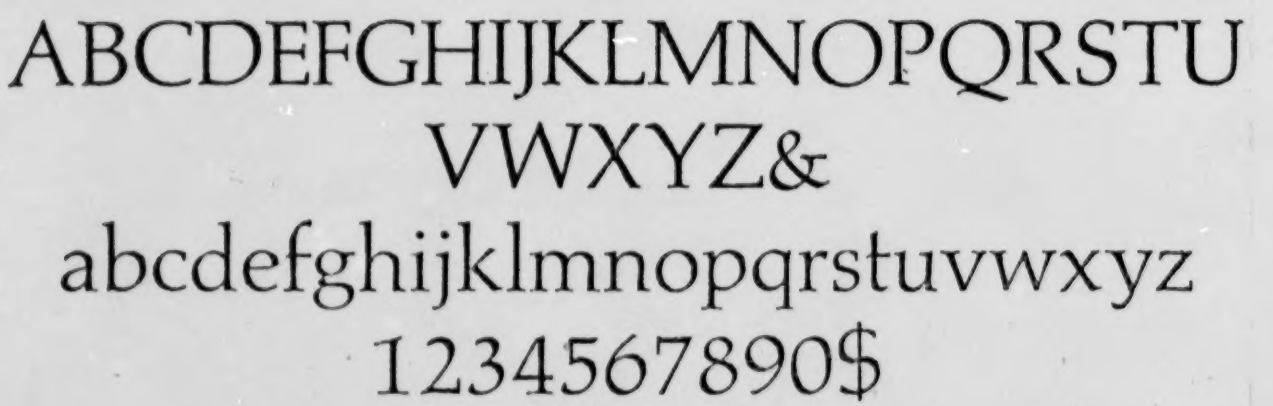


Figure 10-Times Roman, 36 point

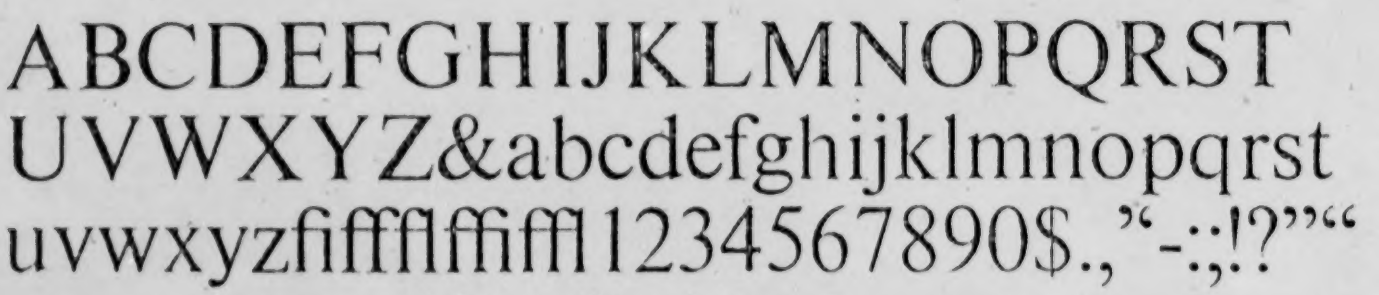

FIGURE 11--SEMANTIC DIFFERENTIAL SCALE SHEET

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Imperfect | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Perfect |
| Hard | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Soft |
| Constrained | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Free |
| Old | ___ | ___ | ___ | ___ | ___ | ___ | ___ | New |
| Passive | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Active |
| Ornate | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Plain |
| Bad | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Good |
| Strong | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Weak |
| Light | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Dark |
| Complex | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Simple |
| Rich | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Poor |
| Beautiful | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Ugly |
| Rounded | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Angular |
| Old-fashioned | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Modern |
| Legible | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Illegible |
| Expensive | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Cheap |
| Feminine | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Masculine |
| Meaningful | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Meaningless |
| Usual | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Unusual |
| Rugged | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Delicate |
| Graceful | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Awkward |
| Tight | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Loose |
| Dirty | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Clean |
| Honest | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Dishonest |
| Formal | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Informal |
| Relaxed | ___ | ___ | ___ | ___ | ___ | ___ | ___ | Stiff |

Table 1

VARIMAX ROTATED FACTOR MATRIX

| | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|---|
| Imperfect/Perfect | -0.09596 | 0.00835 | -0.46386 | 0.00635 | 0.60369 |
| Hard/Soft | 0.81557* | -0.08611 | 0.18693 | -0.07302 | 0.12285 |
| Constrained/Free | 0.76269* | -0.12534 | 0.20559 | 0.26838 | 0.00878 |
| Old/New | 0.05029 | 0.03917 | -0.15046 | 0.80486* | 0.08311 |
| Passive/Active | -0.17042 | -0.19168 | 0.43356 | 0.53493 | 0.22789 |
| Ornate/Plain | -0.24837 | 0.44995 | -0.64990 | 0.15214 | 0.19749 |
| Bad/Good | 0.18656 | -0.38220 | -0.26450 | 0.20056 | 0.63868* |
| Strong/Weak | -0.70412* | 0.28645 | 0.16788 | -0.23138 | -0.12974 |
| Light Dark | -0.74889* | 0.06336 | 0.11514 | 0.07804 | -0.06687 |
| Complex/Simple | -0.21211 | 0.36569 | -0.73229* | 0.21326 | 0.18701 |
| Rich/Poor | -0.12600 | 0.76144* | -0.29864 | 0.15294 | -0.04460 |
| Beautiful/Ugly | -0.35876 | 0.70538* | -0.04635 | 0.05095 | -0.30147 |
| Rounded/Angular | -0.39180 | 0.46002 | -0.21875 | 0.06490 | 0.38089 |
| Old-fashioned/Modern | -0.09755 | 0.15526 | -0.24160 | 0.79520* | 0.11500 |
| Legible/Illegible | 0.31393 | 0.04469 | 0.74598* | -0.14643 | -0.14027 |
| Expensive/Cheap | -0.14914 | 0.75028* | -0.31672 | 0.19545 | -0.05421 |
| Feminine/Masculine | -0.69606* | 0.36953 | -0.06365 | 0.04692 | 0.07571 |
| Meaningful/Meaningless | 0.10265 | 0.62894* | -0.09027 | -0.16195 | -0.20779 |
| Usual/Unusual | 0.16416 | -0.21348 | 0.80925* | -0.01557 | -0.10923 |
| Rugged/Delicate | 0.77129* | -0.24790 | 0.17017 | -0.09871 | 0.16989 |
| Graceful/Awkward | -0.43052 | 0.65087 | 0.11796 | 0.01723 | -0.03054 |
| Tight/Loose | 0.69416* | -0.14418 | 0.27346 | 0.12366 | -0.06011 |
| Dirty/Clean | 0.11806 | -0.21989 | -0.12200 | 0.14534 | 0.73225* |
| Honest/Dishonest | -0.11845 | 0.42402 | 0.54689 | 0.00065 | -0.35226 |
| Formal/Informal | 0.03686 | 0.51142 | 0.04008 | 0.56421 | -0.03888 |
| Relaxed/Stiff | -0.49666 | 0.32808 | 0.20176 | -0.40286 | 0.39231 |

* dimension to which scale was assigned

Table 2

MEAN SCORES OF TYPEFACES ACCORDING TO FACTORS

| Typeface / Factors | Cloister Black | Excelsior Script | Broadway | Legend | Libra | Helvetica | Garamond | Bodoni | Palatino | Times Roman |
|---|---|---|---|---|---|---|---|---|---|---|
| Potency (7) | $22.17^{bg}$ | 41.33 | $20.21^{efg}$ | $29.33^{a}$ | $25.67^{ab}$ | $21.00^{cdefg}$ | $24.21^{bd}$ | $22.46^{bf}$ | $23.93^{be}$ | $24.71^{bc}$ |
| Elegance (4) | 11.29 | 9.00 | $15.33^{a}$ | $15.04^{a}$ | $14.54^{a}$ | $16.33^{a}$ | $15.67^{a}$ | $15.21^{a}$ | $15.00^{a}$ | $16.58^{a}$ |
| Novelty (3) | 17.50 | $15.21^{a}$ | $11.25^{b}$ | $15.21^{a}$ | $11.54^{b}$ | $5.87^{c}$ | $6.17^{c}$ | $7.12^{c}$ | $6.25^{c}$ | $6.75^{c}$ |
| Antiquity (2) | 3.00 | $6.62^{gh}$ | $10.42^{a}$ | $8.75^{bc}$ | $6.67^{fh}$ | $9.58^{ab}$ | $8.71^{bd}$ | $8.25^{bf}$ | $8.62^{be}$ | $7.79^{cdefg}$ |
| Evaluation (2) | $8.21^{df}$ | $10.04^{a}$ | $8.58^{cdf}$ | $7.87^{ef}$ | $8.71^{bcde}$ | $9.96^{a}$ | $9.87^{ab}$ | $9.87^{ab}$ | $9.79^{ac}$ | $9.42^{ad}$ |

(n)=number of scales in each factor

Typefaces which share a superscript do not differ from each other.

FIGURE 12--MEAN SCORES FOR TYPEFACES ON DIMENSIONS

(1) potency (hard/soft)

| | 7 | 14 | 21 | 28 | 35 | 42 | 49 | |
|---|---|---|---|---|---|---|---|---|
| hard | | | 3,6,1,8,9,7,0 | 5,4 | | 2 | | soft |

(2) elegance (rich/poor)

| | 4 | 8 | 12 | 16 | 20 | 24 | 28 | |
|---|---|---|---|---|---|---|---|---|
| rich | | 2 | 1 | 5,9,4,8,3,7,6,0 | | | | poor |

(3) novelty (usual/unusual)

| | 3 | 6 | 9 | 12 | 15 | 18 | 21 | |
|---|---|---|---|---|---|---|---|---|
| usual | | 6,7,9,0,8 | | 3,5 | 2,4,1 | | | unusual |

(4) antiquity (old/new)

| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | |
|---|---|---|---|---|---|---|---|---|
| old | 1 | | 2,5 | 0,8,9,7,4 | 6,3 | | | new |

(5) evaluation (dirty/clean)

| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | |
|---|---|---|---|---|---|---|---|---|
| dirty | | | | 4,1,3,5 | 0,9,8,7,6,2 | | | clean |

1--Cloister Black
2--Excelsior Script
3--Broadway
4--Legend
5--Libra
6--Helvetica
7--Garamond
8--Bodoni
9--Palatino
0--Times Roman